



**Department of Biology**

**College of Education**

**University of Salahaddin-Erbil**

**Subject: Theoretical Plant Anatomy**

**Lecturer's name: Dr. Shilan Abdulaziz Husain**

**Academic Year: First Semester 2023/2024**

# Course Book

<b>1. Course name</b>	Theoretical Plant Anatomy
<b>2. Lecturer in charge</b>	Shilan Abdulaziz Husain
<b>3. Department/ College</b>	Biology/Education
<b>4. Contact</b>	e-mail: shilan.husain@su.edu.krd Tel: (optional)
<b>5. Time (in hours) per week</b>	Theoretical: 2
<b>6. Office hours</b>	
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	<p>There is no doubt that the teacher as a main factor of the teaching process, has a very good and important role in performance the teaching program and preparing the students, teacher is the follower of the results of teaching process and try to progress this process. The teacher is an affected factor among the teaching factors, and has effect on the student's characters and their future, therefor; the teacher must beware in her treatment with the students and the teaching staff. For all the progress that take place in the world, in all the fields, such as cultural, social, scientific, technology, etc. ... , the teacher must suit herself with all these changes and benefit from them in order she can finally to reach these benefits to all peoples that he treat with them.</p>
<b>9. Keywords</b>	
<b>10. Course overview:</b>	<p>Plant anatomy is the study of plant tissues and cells in order to learn more about the way these organisms are constructed and how they work. These studies are very important because they lead to a better understanding of how to care for plants and fight plant diseases. Plant anatomy is also known as phytotomy. A plant is a complex structure that consists of a number of parts which constitute the whole plant. If you learn to identify each individual part, you will gain a much greater understanding as to how the plant works as a whole. This can be helpful to aromatherapists who need to be aware of the part of the plant an essential oil was derived from because there is often a connection between the oils location in a plant and its therapeutic action. Understanding plant anatomy also helps everyone appreciate the art of distillation and extraction. Plant anatomy plays an important role in the understanding of plant biology. A realistic interpretation of morphology, physiology, and phylogeny must be based on a thorough knowledge of the structure of cells and tissues. Furthermore, the knowledge of plant structure is also essential to solve many important everyday problems such as the identification of unknowns, food contaminants, and forensic problems. The aim of this laboratory exercise is to introduce students to some useful techniques in the study of plant structure. At the same time, they will also learn the basic anatomical organization of plant organs, as well as cell and tissue characteristics.</p>

**11. Course objective:**

- 1- List and describe the major plant organs their structure and function
- 2-List and describe the major types of plant cells and their functions
- 3-List and describe the major types of plant tissues, identify their locations and describe their functions.
- 4- learn about primary and secondary growth of stem and root
- 5-Identify and describe the distribution of tissues in the stem, root, and leaf of a monocot and dicot plant.
- 6-Identify, describe, and explain the changes that occur in a dicot stem as it matures.
- 7-Explain the relationship between the distribution of tissues in the leaf and the functions of these tissues.
- 8-To learn the formation of bark and wood.

**12. Student's obligation**

The obligations of students and their throughout the academic year include:

1. Quizzes and daily activities.
2. Discussion.
3. 1st examination
4. 2nd examination
5. Final examination.

**13. Forms of teaching**

Different forms of teaching will be used to reach the objectives of the course: definitions, discussions and conclusions, plates and shapes by using Data-show (in power point) as well as using the white board to illustrate the lecture or sides of the lecture for the students.

**14. Assessment scheme**

Exam (Evaluation)

15 theory + 35 practical = 50

Final examination theory =50

**15. Student learning outcome:**

The objective of the course is to present a foundation of the approach, methods, research goals, evidence, and terminology of plant anatomy and to summarize information on the most recent knowledge of plants. The student may learn to recognize and know the basic features of the plant cell and cell wall components, plant tissues and types of plant tissues, the internal structure of plant organs. The differences between dicotyledonous and monocotyledonous root and the differences between dicotyledonous and monocotyledonous stem, root and leaf. Understanding the healing of wounds and plant structure in relation to the environment. Understanding the structure of the flowers fruits and seeds.

**16. Course Reading List and References:**

- 1- Kurshed, M.Q. (2010). Course Book of plant anatomy for the biology department.
- 2- 2. David, F. Culter, Ted, B., and Dennis, W. Stevensen. (2007). Plant anatomy, an applied approach.
- 3- ▪ Useful references:
- 4- 1- Charles B. Bech. (2010). An introduction to plant structure and development. 2nd edition. Cambridge University Press.
- 5- 2- David, W.M. (2005). Plant Anatomy and Morphology Reed, Texas A&M University.
- 6- 3- Dickison, W. C. (2002). Integrative Plant Anatomy. Academic Press.
- 7- 4- Evert, R. F. (2006). Esau's Plant Anatomy. Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function, and Development. 3rd edition. John Wiley & Sons, Inc.
- 8- 5- Rudall, P.G. (2007). Anatomy of flowering plants. An Introduction to Structure and Development. Cambridge University Press.

**17. The Topics:****Lecturer's name****Week 1:**

Introduction, course outline, importance of biology sciences

**Week2:****Plant cell components**

- Cell wall (primary cell wall, secondary cell wall)
- Plasmodesmata
- pits

**Week3:**

Protoplast

- plasma membrane
- cytoskeleton
- nucleus
- cytoplasm
- mitochondria
- ribosome

**Week4:**

- endoplasmic reticulum
- Plastid
- Golgi apparatus
- Peroxisome
- glyoxisome

Dr. Shilan Abdulaziz  
Husain  
Every lecture takes  
2 hrs.

**Week5:**

-vacuoles

**- Ergastic cell contents**

- Starch grain

- Crystal

- Aleurone grain

- pigments ,enzymes, alkaloids ,tannins, essential oils

**Week6:****Plant tissues**

- types of tissues

- meristematic tissues

-Classification of meristematic tissues

- theories of the shoot and root apex organization

**Week7:****Permanent tissues**

- simple tissues

-parenchyma

- collenchyma

- sclerenchyma

**Week8:****Permanent tissues**

- complex tissues

-xylem tissue

-phloem tissue.

**Week9:****Secretory tissues**

- Secretory tissues

- Glandular tissue

- Lactiferous tissue

**Week10:****Types of tissue system**

- The epidermal tissue system

**Week11:****Types of tissue system**

- Ground or fundamental tissue system

**Week12:****Vascular tissue system**

- Types of vascular bundle

**19. Examinations: (Compositional)**

**Q1/ Write the:**

**1- Structures of Secondary cell wall.**

**2-Functions of Endoplasmic reticulum.**

**3-Missing words:**

The -----is a structure of plasma membrane composed of 4 fused carbon rings that found in the core of this membrane and the cytoskeleton consist of-----  
-----which essentially have ----- of proteins and about ----- in diameter that provide the cell shape -and the space between the nuclear envelope called ----- but the small subunit of ribosome reads the -----  
---- and the peroxisomes contain ----- converting the -----  
-----to water .

**Q2/ A- Draw with labeling the chloroplast.**

**Q2/ B- Compare between:**

**1- Etioplasts and Proplastids.**

**2- Unilaterally compound pitting and blind pit.**

**Q3: Write and draw the steps of cell wall formation.**

**20. Extra notes:**

**21. Peer review**

I reviewed this course book and I approve its contents.

Signature:

Name: